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Shafiq Pirbhai

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EXAMINER

JAKOVAC, RYAN J

ART UNIT

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2145

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/775,214	Applicant(s) PIRBHAI ET AL.	
	Examiner RYAN J. JAKOVAC	Art Unit 2145	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☒ Claim(s) 6 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>02/11/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action is responsive to communications filed on 02/11/2004.

Claims 1-18 are pending.

Claims 1-18 are rejected.

Specification

1. The disclosure is objected to because of the following informalities: paragraph [0016] recites "A short review of operation of a VPN". Examiner suggests changing this to "A short review of the operation of a VPN." Appropriate correction is required. Paragraph [0033] recites "Routes that do not have matching extended community route target are not learnt by the VRF and discarded." Examiner suggests changing this to "Routes that do not have matching extended community route *targets* are not learnt by the VRF and *are* discarded." Appropriate correction is required.

Claim Objections

2. Claim 1 is objected to because of the following informalities: claim 1 is indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites "generating an import route target (ImpRT) tree...". is unclear how or where this generation is done.

3. Claim 2 is objected to because of the following informalities: claim 2 recites the limitation "said PE node". There is insufficient antecedent basis for this limitation in the claim.

4. Claim 6 is objected to because of the following informalities: claim 6 recites "...performing a route refresh whenever said VRFm is not found in said ImpRT tree. *a match is not found*". Appropriate correction is required.
5. Claim 10 objected to because of the following informalities: Claim 10 recites "The method of claim 10, wherein..." A claim cannot depend upon itself. Appropriate correction is required.
6. Claim 13 is objected to because of the following informalities: claim 2 recites the limitations "said routes Rd" and "said VRFd". There is insufficient antecedent basis for these limitations in the claim.
7. Claim 15 is objected to because of the following informalities: claim 15 recites the limitation "the ImpRT filtering." There is insufficient antecedent basis for these limitations in the claim.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claim 16 is rejected under 35 U.S.C. 101. Claim 16 is directed towards a tree data structure which is non-statutory subject matter.

Data structures not claimed as embodied in computer-readable media are descriptive material *per se* and are not statutory because they are not capable of causing functional change in the computer. See, e.g., *Warmerdam*, 33 F.3d at 1361, 31

USPQ2d at 1760 (claim to a data structure *per se* held nonstatutory). Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory (MPEP 2106.01).

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 1 recites “generating an import route target (ImpRT) tree...”. The specification does not describe how or where this generation is done.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1-14, and 17-18 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. 2004/0255028 to Chu et al (hereinafter Chu).

Regarding claims 1 and 18, Chu teaches a method of managing virtual routing forwarding (VRF) tables at a provider edge PE router of a L3 virtual private network (VPN) (Chu, paragraphs [0001], [0006-0008], VRF tables management in a VPN.), said PE router maintaining a VPN-IP master routing information base (RIB) and a sub-RIB for each said VRF table (Chu, paragraph [0004], The VRF table contains a list of all the customer sites connected to the same location (i.e. master RIB). Paragraph [0005], two separate sites containing the same characteristics (i.e. Sub-RIB) are assigned to the same routing table.), comprising the steps of:

generating an import route target (ImpRT) tree comprising all ImpRT attributes currently configured on said PE router (Chu, paragraph [0004], Routing tables are populated and stored within each PE router which contain routing information for all customer sites (i.e. all ImpRT attributes). Routes are populated in the VRF table.);

modifying an ImpRTi attribute of a VRFi table (Chu, paragraph [0108], Sites are deleted from access modules (i.e. VRF tables). Access modules are routing tables, see paragraph [0048]. Paragraph [0046], Routes are added to the VRF table of the PE router.));

searching said ImpRT tree for a match to said ImpRTi attribute to identify a VRFm table having said ImpRTi attribute; and updating said VRFi table accordingly (Chu, paragraph [0048], The PE router searches its VRF table to determine whether to add a route to the VRF table.).

Regarding claim 2, Chu teaches the method of claim 1, wherein said ImpRT tree maintains a list of all ImpRT attributes at said PE node, each ImpRT attribute being associated with all VRF tables that are currently configured with said ImpRT attribute (Chu, paragraph [0004], Routing tables are stored within each PE router which contain routing information for all customer sites (i.e. all ImpRT attributes).).

Regarding claim 3, Chu teaches the method of claim 1, wherein said step of modifying comprises adding said ImpRTi attribute to said VRFi table (Chu, paragraph [0048], Routes (i.e. ImpRTi attributes) are added to the VRF table.)

Regarding claim 4, Chu teaches the method of claim 3, wherein said step of updating comprises copying all routes Rm from said VRFm table into said VRFi table,

whenever said VRFm table is found in said ImpRT tree (Chu, paragraph [0046], PE router determines whether to add a route to the VRF table based on its route targets.)

Regarding claim 5, Chu teaches the method of claim 4, further comprising updating said ImpRT tree to include an association between said ImpRTi attribute and said VRFi table (Chu, paragraph [0004], Route information is stored in VRF tables on the router.).

Regarding claim 6, Chu teaches the method of claim 3, wherein said step of updating comprises performing a route refresh whenever said VRFm is not found in said ImpRT tree a match is not found (Chu, paragraph [0046], Through the routing protocol, PE's advertise their routes to other PEs (i.e. route refresh).).

Regarding claim 7, Chu teaches the method of claim 4, further comprising: searching for said route Rm in a sub-RIBm associated with said VRFm table; and copying said routes Rm from said sub-RIBm into said VRFi table based on all route target attributes configured for said VRFi table, including said added ImpRTi attribute (Chu, paragraph [0046], Routes are added to the VRF table of the PE router.)

Regarding claim 8, Chu teaches the method of claim 7, further comprising adding said route Rm to each VRF table in the routing database available at said PE router (Chu, paragraph [0046], Routes are added to the VRF table of the PE router.)

Regarding claim 9, Chu teaches the method of claim 2, wherein said step of searching is performed through said master RIB (Chu, paragraph [0048], The PE router searches its VRF table to determine whether to add a route to the VRF table.).

Regarding claim 10, Chu teaches the method of claim 10, wherein said master RIB includes all routes in all VRF tables at said PE router and further includes all routes that were filtered out at said PE router using ImpRT attributes (Chu, paragraph [0004], The VRF table contains a list of all the customer sites connected to the same location (i.e. master RIB).).

Regarding claim 11, Chu teaches the method of claim 1, wherein said step of modifying comprises removing said import route target ImpRTi from said VRFi table (Chu, paragraph [0108], Sites are deleted from access modules (i.e. VRF tables). Access modules are routing tables, see paragraph [0048].).

Regarding claim 12, Chu teaches the method of claim 11, wherein said step of updating comprises parsing all routes in said VRFi table and removing all routes from said VRF table (Chu, paragraph [0108], Sites are deleted from access modules (i.e. VRF tables). Access modules are routing tables, see paragraph [0048].).

Regarding claim 13, Chu teaches the method of claim 12, further comprising deleting said routes Rd from the sub-RIB of said VRFd (Chu, paragraph [0108], Sites are deleted from access modules (i.e. VRF tables). Access modules are routing tables, see paragraph [0048].).

Regarding claim 14, Chu teaches the method of claim 13, further comprising propagating deleting in said master RIB every route Rd that no longer matches any ImpRT attribute in said ImpRT tree (Chu, paragraph [0108], Sites are deleted from access modules (i.e. VRF tables). Access modules are routing tables, see paragraph [0048].).

Regarding claim 17, Chu teaches the tree data structure claimed in claim 15, further providing the association between each said VRF and a respective sub-RIB (Chu, paragraph [0005], Multiple separate sites containing the same characteristics (i.e. Sub-RIB) are assigned to the same routing table.),

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chu in view of U.S. 7,139,838 to Squire et al (hereinafter Squire).

Regarding claim 15, Chu teaches the method of claim 1, Chu does not teach further comprises maintaining at said PE router a rejected routes tree comprised of routes that were not accepted during the ImpRT filtering, wherein said step of searching is also performed on said rejected routes tree.

However, Squire teaches further comprises maintaining at said PE router a rejected routes tree comprised of routes that were not accepted during the ImpRT filtering, wherein said step of searching is also performed on said rejected routes tree. (Squire, Col. 4, line 34-59, Old update messages are ignored and the record in the database corresponding to that message is used (i.e. rejected routes are used).).

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine maintaining at said PE router a rejected routes tree comprised of routes that were not accepted during the ImpRT filtering, wherein said step of searching is also performed on said rejected routes tree as taught by Squire with the method of Chu in order that modifications to routing information may be checked against existing data so that old or corrupt information may be ignored allowing only new information to be updated (Squire, Col. 4, line 34-59.).

Regarding claim 16, Chu teaches at a provider edge PE router, a tree data structure comprising for each import route target ImpRT attribute configured on said PE

router (Chu, paragraph [0004-0005]), Chu does not teach a pointer to a virtual routing forwarding VRF table having said respective ImpRT attribute.

However Squire teaches a pointer to a virtual routing forwarding VRF table having said respective ImpRT attribute (Squire, Col. 4, line 55-67, Each network device maintains a database. Pointers are used in the database storing the routing information to separate information.).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RYAN J. JAKOVAC whose telephone number is (571)270-5003. The examiner can normally be reached on Monday through Friday, 7:30 am to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason D. Cardone can be reached on (571) 272-3933. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2145

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RJ

/Jason D Cardone/
Supervisory Patent Examiner, Art Unit 2145